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Proceedings of the Workshop on Implementation of the Oceans Action Plan in the Maritimes Region: A Focus on Ecosystem-Based Management

12-14 October 2005

Fairmont Algonquin Hotel
St. Andrews, New Brunswick

Sponsored by:

Fisheries and Aquaculture Management Branch
and
Oceans and Habitat Branch
Fisheries and Oceans Canada
Maritimes Region

Compte rendu de l'atelier sur la mise en oeuvre du Plan d'action pour les océans dans la Région des Maritimes : L'accent sur la gestion écosystémique

du 12 au 14 octobre 2005

Hôtel Fairmont Algonquin
St. Andrews (Nouveau-Brunswick)

Parrainé par :

La Direction de la Gestion des pêches et de l'aquaculture
et
la Direction des Océans et des habitats
Pêches et Océans Canada
Région des Maritimes

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Dartmouth, N.S. / Dartmouth, N.-É.
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Foreword

This workshop was not carried out as a formal DFO Science Advisory Process; however, it is being documented in the CSAS Proceedings series as it presents some topics of interest related to the advisory process. The purpose of these proceedings is to archive the activities and discussions of the meeting, including research recommendations, uncertainties, and to provide a place to formally archive official minority opinions. As such, interpretations and opinions presented in this report may be factually incorrect or mis-leading, but are included to record as faithfully as possible what transpired at the meeting. No statements are to be taken as reflecting the consensus of the meeting unless they are clearly identified as such. Moreover, additional information and further review may result in a change of decision where tentative agreement had been reached.

Avant-propos

Cet atelier n'a pas été tenu dans le cadre officiel du Processus de consultation scientifique de secteur des Sciences du MPO. Il est toutefois documenté dans la série des Comptes rendus du SCCS, car il couvre certains sujets en lien avec ce processus. Le présent compte rendu fait état des activités et des discussions qui ont eu lieu à la réunion, notamment en ce qui concerne les recommandations de recherche et les incertitudes; il sert aussi à consigner en bonne et due forme les opinions minoritaires officielles. Les interprétations et opinions qui y sont présentées peuvent être incorrectes sur le plan des faits ou trompeuses, mais elles sont intégrées au document pour que celui-ci reflète le plus fidèlement possible ce qui s'est dit à la réunion. Aucune déclaration ne doit être considérée comme une expression du consensus des participants, sauf s'il est clairement indiqué qu'elle l'est effectivement. En outre, des renseignements supplémentaires et un plus ample examen peuvent avoir pour effet de modifier une décision qui avait fait l'objet d'un accord préliminaire.

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ABSTRACT

A three-day workshop was held in the Maritimes Region in support of the implementation of Canada's Ocean Action Plan (OAP), released in May 2005. The main objective of the workshop was to discuss the application of ecosystem-based management to ocean activities, with a primary focus on fisheries, and to explore ways of ensuring all Fisheries and Oceans Canada (DFO) sectors work collaboratively in support of integrated management planning. The workshop consisted of a series of informative presentations, followed by a case study exercise, and an open space priorities identification exercise. The methodology used in the case study exercise was well received and deemed useful for future planning to ensure the full integration of ecosystem conservation objectives, particularly for fisheries management plans. The open space exercise and plenary discussions yielded a total of 11 specific recommendations in addition to identifying what participants thought to be the top ecosystem impacts or issues facing the Maritimes Region today. The outcome of the workshop may be useful in guiding the next step, which is to develop an action plan to fully meet the commitments of the OAP.

RÉSUMÉ

Un atelier de travail fut convenu dans la région des Maritimes, donnant appui à la mise en œuvre du Plan d'action du Canada pour les océans émis en mai 2005. L'atelier avait pour but principal d'examiner la mise en application d'une gestion écosystémique des activités humaines en milieu océanique, et ce misant principalement sur le secteur le la pêche commerciale, ainsi que d'explorer des façons d'assurer un travail collaboratif plus étroit parmi tous les secteurs du ministère des Pêches et des Océans (MPO) en sorte que leurs efforts collectifs soit plus apte à promouvoir la planification de gestion intégrée. L'atelier débuta avec une série de présentations informatives, suivi d'une étude de cas, et terminant avec une identification des questions prioritaires en séance plénière. La méthodologie présentée dans les études de cas fut bien reçue et l'on estime que celle-ci se fera utile dans l'avenir près pour assurer une meilleure planification fondée sur des objectifs écosystémiques, surtout en ce qui a trait aux plans de gestion des pêches commerciales. L'atelier a débouché sur onze recommandations au total ainsi que sur une liste de défis qui, selon les participants, sont couramment les plus importants face au progrès sur le plan ecosystémique dans la région des Maritimes. Une prochaine étape à franchir est l'élaboration d'un plan d'action pour mettre en œuvre tous les engagements du Plan d'action pour les océans.

1.0 EXECUTIVE SUMMARY

Since Canada's *Oceans Act* was proclaimed in 1997, DFO has developed a number of initiatives intended to promote integrated management of ocean activities. The *Oceans Action Plan*, released in May 2005, gives operational impetus to the *Oceans Act*. The *Fisheries Act*, a parallel set of legislation regulating fishing activities, commands the attention of considerable resources within DFO. Attention is needed to ensure that conservation objectives identified in fisheries management plans are consistent with the principles of the *Oceans Act*, and objectives established through integrated management and planning processes. In support of this, a three-day workshop, co-chaired by Fisheries and Aquaculture Management and the Oceans and Habitat Branches and attended by representatives of all sectors of DFO and National Headquarters, was held in St. Andrews on October 12 to 14, 2005.

Key objectives of the workshop included discussing the application of ecosystem-based management to ocean activities, with a primary focus on fisheries, and exploring ways of ensuring closer and more effective collaboration by all DFO Sectors in support of integrated management planning. The workshop opened with a series of presentations on topics and initiatives pertinent to integrated management, followed by a case study in break-out groups, and closing with an open space exercise and plenary discussion in which participants identified what they felt were the top ecosystem impacts or issues facing the Maritimes Region today, along with suggested short, medium and long-term actions to address those issues. The intention is to use these results as a guide for the next step beyond the workshop, which is to develop an action plan to fully meet the commitments of Phase I of the OAP and to prepare the region for Phase II.

The case study component of the workshop provided participants with a means of assessing the degree to which existing management plans for human use activities currently achieve national and regional ecosystem objectives. Six break-out groups were assigned one of three selected areas for this exercise. The exercise focused primarily on fisheries activities, with only one of the six groups selecting an activity other than fishing as the object of their case study. Overall results were fairly consistent between groups. Most found the provided template methodology useful for enabling systematic evaluation and identification of gaps in both the approach and management plans. On the whole, groups felt the existing planning tools addressed objectives of the National Ecosystem Framework very poorly, with the exception of population productivity objectives for exploited species, which is covered in most major fishing plans either explicitly or implicitly. The break-out groups unanimously agreed that current planning tools do not provide sufficient, if any, indicators or reference points for benthic habitat and trophic structure objectives, and that there was no real consideration of non-commercial species by-catch. Some overarching planning tools such as the draft Coral Conservation Plan or the Gully Marine Protected Area Regulations were found to be a useful complement in addressing selected ecosystem conservation objectives.

Building on the key themes that emerged from the case study exercise, the groups collectively identified what they felt were the most critical ecosystem-based impacts or issues facing the Maritimes Region today and, in the open-space exercise, developed suggestions for short, medium and long-term actions to address them. Managing by-catch and discards, limiting benthic impacts, managing trophic impacts, and regulating fishing mortality were ranked by all DFO sectors as the top operational objectives, in that order, while the most critical implementation issues deemed to need attention beyond current program delivery were balancing ecosystem and socio-economic objectives, achieving stakeholder buy-in,

developing indicators and reference points along with monitoring, and establishing appropriate ecosystem boundaries and scale. In addition to the critical issues identified, a total of 11 specific recommendations stemming from plenary discussions throughout the course of the workshop are listed within the Proceedings. Some of these recommendations lend well to immediate action, while others are better suited for potential consideration in an action plan.

The workshop focused primarily on how ecosystem-based management can be applied to fisheries management plans, and touched on its relationship to integrated management. The outcome fell somewhat short of the original terms of reference which sought to prioritize activities of a work plan to achieve Phase I deliverables of the *Oceans Action Plan* and to prepare the region for delivery of Phase II. Nevertheless, the results of the workshop can be used to guide a subsequent action planning exercise for consideration by the Regional and Departmental Management Committees. The workshop was very successful in raising understanding across all DFO sectors of terminology and the linkages between fisheries management, ecosystem-based management, and integrated management. The event highlighted the need for continued phase-in of the introduction of ecosystem-based management to all fisheries management plans, while at the same time being realistic about what can be achieved especially in the short-term. Finally, the workshop contributed to strengthening the culture of collaboration between Fisheries and Aquaculture Management, Science, and the Oceans and Habitat Branches in support of integrated management planning.

2.0 INTRODUCTION

A three-day workshop co-chaired by Fisheries and Aquaculture Management Branch (FAM) and Oceans and Habitat Branch (OHB) was held in St. Andrews, New Brunswick, on October 12 to 14, 2005. Close to 70 participants from all sectors of Fisheries and Oceans Canada (DFO) Maritimes Region, including Canadian Coast Guard (CCG), Small Craft Harbours (SCH), Corporate Services, Area offices, and National Headquarters (FAM and Oceans Sectors only) in addition to FAM, OHB and Science, gathered to focus on Ecosystem-Based Management (EBM), the key theme of the workshop. This report outlines the development, proceedings and outcome of the event. A list of participants can be found in Appendix 1, and terms of reference in Appendix 2.

2.1 Background

Since Canada's *Oceans Act* was proclaimed in 1997, DFO has developed a number of initiatives intended to move us toward integrated management of oceans activities. The *Oceans Action Plan* (OAP), released in May 2005, gives operational impetus to the *Oceans Act*. The *Oceans Act* augments the powers of the *Fisheries Act*, which regulates fishing activities and commands the attention of considerable resources within DFO. Fisheries Management Plans are in place for many stocks, the objectives of which have been discussed in the Objectives-Based Fisheries Management (OBFM) exercise initiated in 2000. Attention is needed to ensure that conservation objectives identified in management plans are consistent with the principles of the *Oceans Act*, and objectives established through integrated management and planning processes.

Integrated Management (IM) can be defined as a comprehensive and coordinated approach to planning and decision making for sustainability, based on the balanced consideration of the full range of interests and environmental, social, cultural, economic and institutional

objectives for a management area. It is a holistic approach requiring input and collaboration by all management authorities and stakeholder groups. Similarly within the Department, all sectors need to work collaboratively to ensure consistent interactions and approaches to all stakeholders. A comparable level of collaboration is needed to successfully implement Ecosystem-Based Management, a subset and critical building block of IM. EBM consists of the management of human activities so that ecosystem components, functions and properties are restored and/or maintained at appropriate temporal and spatial scales. An EBM approach allows us to gauge the cumulative impacts of all ocean activities against specific ecosystem conservation objectives.

This workshop provided an opportunity for Maritimes Region staff to:

(1) discuss ways and means of implementing EBM, with primarily a fisheries management focus; and
(2) explore how different DFO sectors can improve and optimize internal collaboration to better support IM initiatives under the OAP, in a manner that ensures the intents of both the *Oceans* and *Fisheries Act* are achieved.

2.2 Objectives and Scope

Specific objectives established under the original Terms of Reference for the workshop were:

- To ensure a consistent approach to Integrated Management within and amongst the Fisheries and Aquaculture Management, Oceans and Habitat, and Science sectors;
- To ensure that the objectives of Objectives-Based Fisheries Management are consistent with those of Integrated Management;
- To provide DFO regional staff with a common understanding of current integrated management issues and initiatives; and
- To recommend and prioritize activities of a work plan to achieve Phase I deliverables of the Oceans Action Plan and to prepare the region for Phase II.

In practice, the scope of the workshop spanned both EBM and IM issues. However, the case-studies and open-space exercises were focused more strongly on EBM than IM, thus falling somewhat short of the original objectives. This occurred because as the workshop planning progressed, it became clear that improving understanding of EBM across all DFO Sectors and providing hands-on examples of how to apply EBM in their day-to-day work was of higher priority and a needed precursor to successful IM implementation. To that end, objectives were adjusted to focus on EBM.

In keeping with an EBM scope, the workshop introduces an analytical technique to assess the level to which existing ocean activities impact on the ecosystem. Specifically, the methodology allows us to gauge the impact of each ocean activity across a range of ecosystem conservation objectives, as well as the cumulative impact of multiple ocean activities on selected ecosystem objectives. However, it does not attempt to introduce a framework for achieving a sustainable and practical balance of ocean activities based on agreed-upon ecosystem and socio-economic objectives. Although the latter step is widely recognized as critical to the successful implementation of IM, the Workshop Steering Committee deemed that it would not be feasible to tackle both socio-economic and ecosystem objective frameworks in one workshop. A two-step process would be needed, perhaps in the form of a second workshop, to address the integration of socio-economic with ecosystem objectives in an IM context.

2.3 Workshop Format and Structure

The workshop was convened over two half days and one full day. The format consisted of a series of practical and informative presentations and discussion in plenary, followed by case studies in breakout groups on the second day, and wrapping up with a priority setting exercise in plenary on day three. The full agenda is provided in Appendix 3.

The presentations and exercises were designed to raise understanding of terminology, explore the relationship between ecosystem-based management, integrated management and fisheries management, and develop elements of an action plan to support the delivery of Phases I and II of the *Oceans Action Plan* in the Region. Workshop participants were provided with some background reading to enable them to more fully participate in this exercise (see References). Because many participants did not have the benefit of expert background, results of the workshop may not be fully meaningful and therefore, are intended to serve only as a guide to future action planning. Detailed methodology and results of the case study and priority setting exercises can be found in sections 4 and 5 of these proceedings.

3.0 PRESENTATIONS

Several context-setting presentations were given by FAM, OHB and Science representatives on Day 1 of the Workshop. Summaries of their presentations are provided below.

3.1 Oceans and Coastal Management in the Maritimes Region (T. Hall)

The Oceans program in the Maritimes began in 1997 directly as a result of the passage of Canada's *Oceans Act*. This was in response to increasing recognition that sectoral, sometimes ad hoc, approaches to the management of oceans activities were ineffective. The *Oceans Act* provided the legislative authority for the program, and at its core were the principles of integrated management, the precautionary approach, collaboration, an ecosystem approach and sustainable development. The *Oceans Act* was followed in 2002 by the release of *Canada's Oceans Strategy*, and a *Policy and Operational Framework for Integrated Management of Estuarine, Coastal and Marine Environments in Canada* and most recently Canada's *Oceans Action Plan* in 2005. These documents form the basis for our current program, and define the principles and methodology we employ.

The major objective of the Oceans program is the development of integrated management plans for all of Canada's offshore and coastal areas. The process for the development of these plans is straightforward but comprehensive. Once a planning area has been determined using a combination of ecological and geopolitical factors, an assessment of ecological and socio-economic conditions is completed. Concurrently, a collaborative planning and management framework is developed involving all government, industry and community interests. Utilizing this collaborative framework, a series of objectives that focus on both ecosystem and human use (i.e., socio-economic and governance) elements are developed. Based on these objectives an integrated management plan is developed that is designated by the Minister under the *Oceans Act*. Finally, an implementation and reporting system consisting of monitoring, review and adaptation is developed.

The recent release of Canada's *Oceans Action Plan* (OAP) prioritized current areas of activities across the country, and had a major focus on integrated management for sustainable development – one of the four key pillars of the OAP. Two of the other activities

in the region supported by the OAP include Marine Protected Areas, and development of a joint collaborative planning framework in the Gulf of Maine with the US.

Under the IM pillar of the OAP, progress on implementation of the Integrated Management program in the Maritimes Region has been focused on two primary examples. The Eastern Scotian Shelf Integrated Management (ESSIM) Initiative has developed a draft plan for the offshore component of the eastern Scotian Shelf that is currently under review. It is hoped to have final approval as Canada's first *Oceans Act* integrated management plan in 2006. The Bras d'Or Lakes Collaborative Environmental Planning Initiative (CEPI) is an example of a coastal management area and is community-led, and supported by the Oceans program. This initiative has completed the assessment phase and will begin development of a plan in 2006.

3.2 Fisheries Management Planning: A Changing Process (C. Annand)

DFO's fisheries management planning process has evolved significantly over the past two decades in response to the changing legal and policy framework in recent years. A growing number of driving forces, both domestic and international, have been behind the change. Through ratification of the United Nations Convention on the Law of the Sea in 1982, Canada is compelled to abide by a number of global commitments and international agreements focusing on a range of conservation issues. Domestically, change is being driven by the introduction of new conservation oriented legislation and policy review. The *Oceans Act*, *Species at Risk Act*, and most recently the *Oceans Action Plan* (OAP) require that Resource Management introduce broader dimensions to its planning process and management plans. The *Atlantic Fisheries Policy Review* pointed to the need for a *Fisheries Act* renewal, designed to better support and promote co-management initiatives with the fishing industry and provide a cornerstone for meeting both conservation and socio-economic objectives.

In keeping with the changing legislative and policy framework, the scope of the planning process and management plan documents has expanded considerably. Management plans of the 1980s focused on single species, setting Total Allowable Catches (TAC) and allocation between fleets. In 1995, Integrated Fisheries Management Plans (IFMP) broadened the scope of annual plans to include all relevant elements of policy and regulation, integrate input from all DFO Sectors, and to introduce the first formal steps to co-management with industry. Objective-Based Fisheries Management (OBFM) strengthened the process in 2000 with the introduction of clear, measurable ecosystem conservation and socio-economic objectives and accompanying strategies, indicators and reference points, hazards analysis, performance measures and decision rules to be initiated when reference points may be exceeded. Although ecosystem-based management was a component of the OBFM process, our ability to address the broader, emerging ecosystem conservation concerns increased through the early 2000s. Integrated management (IM), the most recent paradigm, incorporates the objectives-based and the ecosystem-based features while introducing an area-based approach for all human activities impacting a marine area.

The OBFM approach has been applied to three fisheries to date (groundfish, swordfish and herring), and is in progress with the development of the next multi-year inshore scallop fishery IFMP. The most comprehensive application of OBFM to date has been with the Scotia Fundy Groundfish fishery which identifies selected biodiversity, productivity and habitat conservation objectives consistent with those in DFO's National Framework of Ecosystem Objectives, and ties them in with concrete strategies and management measures to achieve them.

Delivery of OBFM requires considerable collaboration among Science, Oceans and Habitat Branch, Fisheries and Aquaculture Management, and industry stakeholder groups, and takes a number of years of sustained and coordinated effort to implement. However, the benefit is that the OBFM planning model, which builds on the IFMP model, is fully integrated within the IM process with which it shares a common set of ecosystem conservation objectives. Under the IM umbrella, the OBFM model offers a more cohesive departmental approach to oceans management and potential for streamlining survey work to meet integrated needs of all three Branches, as well as for a more efficient and common interface with industry.

As one of the key ocean user groups, the fisheries sector has come to the realization that the broader ecosystem objectives developed under the IM process must be addressed in industry fishing plans. Delivering on the OAP from a Resource Management perspective will be achieved largely through the Fisheries Management Plan and strengthened linkages between the OBFM and IM processes.

3.3 Eastern Scotian Shelf Integrated Management (ESSIM) Initiative (S. Coffen-Smout)

The Eastern Scotian Shelf Integrated Management (ESSIM) Initiative is a collaborative ocean management and planning process being led and facilitated by DFO under Canada's *Oceans Act*. The primary aim of the Initiative is to develop and implement an integrated ocean management plan for this large offshore marine region. The multi-year, strategic level plan will provide long-term direction and a common basis for integrated, ecosystem-based and adaptive ocean management.

The assessment phase of the Initiative (started in 1999) has addressed the analysis of human use and management systems through the completion of a use audit, a regulatory overview, issues papers, a Scotian Shelf atlas, as well as ongoing data collection and GIS for decision support. Progress on ecosystem understanding and conservation planning includes the completion of a Scotian Shelf ecosystem overview, support to ongoing and new research (e.g., Gully MPA science, benthic habitat classification, and a state of the ecosystem report), and completing the ecosystem assessment, including the ongoing identification of ecologically and biologically significant areas.

The ESSIM planning process involves a broad range of interests, including government, First Nations, ocean industry and resource users, environmental conservation groups, coastal communities, and university researchers. The collaborative planning aspect of ESSIM involves various sectors and communities of interest via bilateral and multilateral discussions, including annual ESSIM Forum workshops (a collective of all organizations and individuals participating in the ESSIM Initiative), online discussions, and community workshops. Governmental coordination occurs via the Federal-Provincial ESSIM Working Group (est. 2001) and newly formed senior inter-governmental Regional Committee on Ocean Management (est. 2005).

In February 2005, the ESSIM Planning Office presented a draft *Eastern Scotian Shelf Integrated Ocean Management Plan* (http://www.mar.dfo-mpo.gc.ca/oceans/e/essim/essim-plan-e.html) to the ESSIM Forum for consideration. The draft Plan was under public review until October 31, 2005. The Plan takes an objectives-based approach to integrated ocean management, through the development of ecosystem (conservation) objectives and indicators, the development of human use objectives to address social, economic and governance needs, and the design of an integrated decision and monitoring framework. The Plan includes 14 management strategies and multiple related actions under the three overarching themes that define the scope of the plan addressing multiple human use, marine

ecosystem-based management and conservation, and collaborative planning and management coordination.

The 3rd ESSIM Forum Workshop in February 2005 was the first step in the plan review process. There is general support for and acceptance of the directions outlined in the plan and a keen desire for action on the objectives-based management framework, the stakeholder advisory body, the Regional Committee on Ocean Management, and the management strategies and actions. Public reaction to the plan to date has provided a solid basis for DFO to move forward on next steps.

Additional information on the ESSIM Initiative is available online: http://www.mar.dfo-mpo.gc.ca/oceans/e/essim/essim-intro-e.html.

3.4 Collaborative Environmental Planning Initiative (D. Duggan)

The Bras d'Or Lakes Collaborative Environmental Planning Initiative (CEPI) arose from the recognition of the need to develop an overall management plan for the Bras d'Or Lakes and surrounding watershed. This plan, and the process to develop and implement it, is meant to address the many environmental issues present in the Lakes (fishery declines and closures, water quality impacts, clear cutting, erosion, invasive species, etc.), including their social and economic dimensions. It was recognized that a multi-partnered approach of working together (collaboration) involving all levels of government (federal, provincial, municipal, First Nations), industry, NGOs, academia, and other local residents, is required to develop and implement the plan(s) that will restore and protect this unique environment. First Nations communities are playing a strong lead role in supporting and coordinating much of these efforts primarily through the Unama'ki Institute of Natural Resources (UINR), a research, monitoring, education, and management organization representing the five First Nations Bands in Cape Breton. The approach being taken will be assisted operationally through the formation of a dedicated Secretariat that will provide coordination, research, communications, and administration for the overall process. Efforts of the Secretariat will be assisted by other government departments and partners as needed.

Since 2003, federal, provincial, and municipal governments, along with leaders from the First Nations communities, have been working together to develop a common understanding and approach for developing a management plan for the Bras d'Or Lakes and watershed lands. These discussions culminated in October 2003 with the first Collaborative Planning Workshop held in the communities of Eskasoni and Wagmatcook. During this workshop, over 100 senior members of government and First Nations representatives came together to solidify support for the initiative and set direction to move forward. In October 2004, a second, broader public workshop was held in order to engage the public as a next step in the Collaborative Planning process. Over 150 people attended this two-day event in Wagmatcook, hosted by the UINR.

To date, the major issues identified in the Bras d'Or to be addressed through the CEPI can be separated into the following two categories: Environmental Issues, and Planning and Management Issues. While good progress has been made in a short amount of time with this initiative, there remains much to do to move forward, including formalizing the process and solidifying support.

Next steps include the development of a task team to begin discussion on the elements of a draft management plan and a process to ensure long-term support for the initiative. Discussions and associated projects will also continue with DFO Science and the Eskasoni

Fish and Wildlife Commission to address identified knowledge gaps in order to develop a better understanding the Bras d'Or Lakes ecosystem.

3.5 Canada-US Collaboration in the Gulf of Maine (T. Hall)

In June 2005, Canada released an *Oceans Action Plan* (OAP) that followed and builds upon Canada's *Oceans Act* (1996) and *Canada's Oceans Strategy* (2002). The OAP outlines priority action items under four pillars. The first of these is International Leadership, Sovereignty and Security. Actions under this pillar include addressing foreign over-fishing, Arctic sovereignty and attainment of World Summit on Sustainable Development (WSSD) goals and objectives. In the Maritimes Region, the priority activity under this pillar is the development of a collaborative approach between Canada and the US towards integrated management in the Gulf of Maine.

Shared with Environment Canada, initial activities in Phase I of the OAP will build on existing initiatives such as the Gulf of Maine Council on the Marine Environment and transboundary fisheries management mechanisms. The preliminary work will focus on an assessment and analysis of existing activities and ecological conditions. However, the broader objective is to identify the Gulf of Maine/Bay of Fundy area as a priority area for integrated management in Phase II of the OAP, and to develop a consensus on a collaborative planning and management process for the Gulf of Maine.

The deliverables for Phase I include a draft planning model and collaboration mechanism, development of criteria for identification of Ecologically and Biologically Significant Areas (EBSAs) and the initiation of an Ecosystem Overview and Assessment Report (EOAR) as well as an Ocean Use Atlas. These will be achieved by consultation and collaboration with existing mechanisms, supported by the Oceans and Coastal Management Division. This initial work is clearly aimed at evaluation of current activities and conditions and exploring options for the development of an integrated planning and management framework for the Gulf of Maine.

3.6 Gulf of Maine Ecosystem-Based Management Initiatives (S. Gavaris)

Ecosystem-based management involves two aspects; understanding how human activities impact the ecosystem and understanding how the ecosystem affects the activities. We do not manage the ecosystem. The emphasis is on "management" of the human activities in a way that controls how the activity will impact the ecosystem, and at the same time, recognizes how the ecosystem influences the way we should regulate this activity.

A tacit consensus is emerging, recognizing three principal conservation objectives, maintaining productivity, preserving biodiversity and protecting habitat. To make ecosystem-based management operational, these broad ecosystem conservation objectives need to be stated as operational strategies. Operational strategies are succinct statements of "what" will be done to achieve the objectives. Operational strategies are specified by a performance indicator and a reference point.

These two dimensions, managed activities and conservation objectives, represent the fundamental aspects of operational ecosystem-based management. The ecosystem-based management initiatives in the Gulf of Maine area have built on this framework.

Ecosystems are not easy to define and their boundaries are not clear-cut. Areas used for management are necessarily a compromise between population structures and practical

administrative convenience. It is practical to consider the eastern Georges Bank as a distinct area for managing Canadian fishing activity. This area offers an opportunity to consider integrated management for a relatively simple situation with few managed activities.

The recent initiatives in this area include:

- a Fisheries Status Report in 2002 where the ecosystem strategies were reviewed and evaluated for the Canadian groundfish fishery on Georges Bank;
- the Gulf of Maine Area Global Ocean Observing System (GoMA-GOOS) workshop in 2004 that developed and established the suite of operational strategies as a common framework between Canada and USA;
- a review of Management Plan compliance with EBM in 2005 that evaluates how well the plans address the operational strategies for the conservation objectives;
- currently in progress, the performance indicators for each of the operational strategies are being examined to determine trends and, where reference points have been established, to evaluate how well the tactical management measures are doing at implementing the strategies, essentially extending the Fisheries Status Report on groundfish to all fisheries in the area.

The 2005 review of Management Plan compliance with EBM reveals a pattern that is probably generic. Regulating exploitation for the utilized resources has received the most attention while aspects pertaining to biodiversity and habitat concerns have gained prominence only in recent decades. This pattern reflects the perceived importance with respect to impact and the evolution of fishery science. Two broad areas emerge from the suite of operational strategies as requiring more attention, managing discards/incidental mortality and limiting disturbance of benthic habitat.

Addressing concerns about discards/incidental mortality involves:

- effective at-sea monitoring of disposed by-catch
- finding ways to limit by-catch, e.g. area closures, gear modifications
- mechanisms to account for by-catch mortality in assessments and resource allocation

Strategies for limiting the impact of fishing activities on seascapes and habitats are currently under development and not well established yet. Their development requires:

- classification of habitat
- an understanding of the impacts by fishing on the various habitats
- quantification of the bottom area affected by the fishing activities.

Accurate quantification of area fished will require enhanced positional monitoring of fishing activities.

The two dimensions, operational strategies and managed activities, are fundamental for making ecosystem-based management operational. Building on existing management plans and progressively evolving towards encompassing the broader ecosystem operational strategies is more likely to achieve success than revolutionizing the management system. The suite of operational strategies embraces emerging ecosystem concerns but puts them in the proper context using a comprehensive framework that recognizes and includes the "conventional" fisheries management considerations. In particular, controlling exploitation of utilized resources remains an important and essential element of Ecosystem-Based Management planning. We need to strike a proper balance in how much effort is diverted to the emerging priorities and how much continues to be directed towards those things that are still considered important that we have been doing in the past. Many indicators tell us something about the ecosystem but not all of these indicators help to manage human

activities. Defining the operational strategies first and using them to assist with choosing pertinent indicators is a valuable aid. The greater demands for environmental monitoring are receiving attention but the need for improved fishery monitoring is less well recognized, but essential for successful implementation. Every cell of these two dimensions, operational strategies and managed activities, may not warrant equal attention; some operational strategies can be of marginal consequence for a particular managed activity. Prioritization of the suite of operational strategies for all of the managed activities remains an essential step.

3.7 Related Initiatives (T. Worcester and P. Boudreau)

There are a variety of regional and national initiatives that are not directly tied to the *Oceans Action Plan* but that will be important to incorporate into the regional IM planning process. Regional examples include:

- DFO's Habitat Management Program, which continues to conserve, restore and develop freshwater and marine fish habitat through partnerships and regulatory processes.
- Regional Advisory Process to establish a framework for benthic classification in the Scotia-Fundy area.
- Coral Conservation Plan, which describes strategies for the protection, research, monitoring and increased awareness of corals in the Region.
- The Discovery Corridor initiative to document marine biodiversity within a marine "corridor" that extends from coastal NB, through the Gulf of Maine, to the abyssal plain of the Scotian Shelf.
- Centre of Expertise on ocean model development and applications, including oceanographic modeling at regional and NW Atlantic scales.
- Applied Coastal Ecosystem Sciences (ACES), which was a change to the St. Andrews Biological Station (SABS) management structure to encourage long-term, collaborative, multidisciplinary programs.

National initiatives include:

- National Advisory Process to establish a framework for assessment of impacts of fishing gear on benthic habitat and communities.
- Statement of Canadian practice on the mitigation of seismic noise in the marine environment.
- *Species at Risk Act*, which has many requirements (e.g. determination of recovery targets and critical habitat) that will need to be linked with IM activities.
- Ballast Water Regulations as a tool for minimizing the introduction and spread of invasive species as a result of ballast water exchange.
- Invasive Alien Species Strategy, which seeks to establish a coordinated national management framework to address the issue of invasive alien species.

The presentation also attempted to describe the differences between the framework for benthic habitat classification (developed regionally) and the framework for identification of ecologically and biologically significant areas (EBSAs, developed nationally). The framework for benthic habitat classification was described as a model for predicting the distribution and sensitivity of benthic communities based primarily on biophysical parameters (temperature, depth, bottom currents, oxygen, chlorophyll, etc.). The framework for identification of EBSAs was described as a set of criteria (uniqueness, aggregation, fitness consequences, resilience, naturalness) by which the ecological or biological significance of an area might be evaluated.

4.0 CASE STUDIES

The case study portion of the workshop concentrated on existing management plans for ocean activities in three selected areas – Georges Bank, St Marys Bay and the Sable Banquereau portion of the ESSIM area – with participants assigned to six breakout groups. The objective of the exercise was to help identify strengths and weaknesses in our ability to achieve national and regional ecosystem objectives under current resource management planning processes. By identifying deficiencies in the current planning tools and processes, participants were expected to draw out key issues or impediments to implementing the OAP in the Maritimes Region, and commence identifying and prioritizing management measures or actions needed to continue progress in this area. The following case-study approach was designed to achieve this two-fold process.

4.1 Methodology

A generic template in the form of a table was developed encompassing the range of elements that would have to be considered if developing an integrated ocean management plan. The table includes a summary of National Ecosystem Objectives, conceptual objectives[1] and operational objectives[2] stemming from the latter, along with a full range of potential ocean activities in a matrix format. The body of the generic template was populated with activity-specific impacts which may affect corresponding operational and conceptual objectives. Three area-specific templates were drafted in a similar manner, though with only selected operational objectives and existing ocean activities listed, and the body of the matrix left blank. The operational objectives included in the templates represent only a partial and condensed sample of those found in the literature, but were sufficient for the purposes of the exercise. These templates were provided to the breakout groups, along with a case study worksheet containing a series of questions relevant to the area-specific templates and some general questions on the identification of critical issues. The templates and worksheet can be found in Appendices 4A and 4B.

An array of reference material was made available to each breakout group to help complete the exercise. The materials included copies of any management plans, licence conditions, joint project agreements or relevant regulations or information on advisory processes available for fisheries and aquaculture based activities, along with any available planning documents for other ocean activities or overarching planning documents, such as the draft Statement of Canadian Conduct on the Mitigation of Seismic Noise in the Marine Environment, the draft Coral Conservation Plan, or the draft document *Scotian Shelf; An Atlas of Human Activities*, to name a few.

The six break-out groups, composed of a mix of personnel from all sectors of DFO, were assigned two groups per case-study area. They were asked, based on expertise and interests in each group, to select an initial Operational Objective (one column) and an initial ocean activity (one row) to investigate in detail with the help of prescribed questions for each cell from the worksheet (A1-A3 and B1-B3), with the option of completing more than one column/row if time permitted. However, none of the groups were able to complete more than

[1] Conceptual Objective is defined as a high level, qualitative objective, which provides a statement of vision for the future that has been agreed upon by stakeholders.

[2] Operational Objective is defined as a lower-level objective or goal that can be practically implemented. It should have a direct and practical interpretation in the context of a resource and should be able to be evaluated through some measure of performance. In the case studies for this workshop, they are expressed as an action verb, an indicator and a reference point. The terms "Operational Objective" and "Operational Strategy" as defined in section 3.6 of this document are used interchangeably.

one row and column selection of each. The purpose of this exercise was not to obtain activity-specific responses to operational objective requirements, but rather was to discover and draw out strengths and weaknesses or gaps in the current array of resource planning tools available in addressing ecosystem objectives, and to brainstorm on potential ways forward. The intent was to demonstrate to participants how applying the template concept to their management planning process can facilitate achieving ecosystem objectives in an IM context. To that end, individual group answers to the worksheet questions are not reported in these proceedings. Instead, a synopsis of the breakout group results was developed based on material handed in upon completion of the exercise.

4.2 Results

The next two sections present a synopsis of the breakout group results on the case study exercises. Answers to worksheet sections A and B, and to question C1 are summarized in 4.2.1, and the balance of section C is summarized in 4.2.2. All but one of the six groups selected a fishery as the impacting activity for the exercise in section B of the worksheet. Oil and Gas exploration/exploitation was the only other activity selected.

4.2.1 Planning tools/Methodology assessment

Overall, the existing planning tools, primarily fishery management plans and associated licence conditions and regulations, were felt to address operational objectives derived from the National Ecosystem Framework very poorly. Population productivity objectives for exploited species were cited by only two groups as being adequately addressed by the planning tools provided. That being said, the plans that address productivity objectives of exploited species offer limited scope for follow-up monitoring to ensure predictions are accurate. Occasionally, an overarching planning tool such as the Gully Marine Protected Area (MPA) regulations, Coral Conservation closure, or Draft Protocol for New Fisheries or the Leatherback Sea Turtle Recovery Plan was cited as contributing to address specific operational ecosystem objectives in a given geographic area.

The groups unanimously pointed out current planning tools identify few, if any, indicators or reference points for benthic habitat and trophic structure objectives, and that there was no real consideration of non-commercial species by-catch. On the whole, fishery management plans in their present form offer a limited scope to deal with ecosystem objectives for the purpose of EBM planning. This clearly identifies the complexity that will be involved in implementing the OAP and the need to consider an incremental approach as data becomes available. At least three groups indicated a simpler framework is needed, with two groups recommending intermediate level planning tools – for instance, grouping activities by impact (e.g. bottom contact fisheries or activities) and developing operational objectives relevant to the groupings. This will help ensure DFO is consistent in its messages across multiple industry sectors and allow for the efficient deployment of its expertise.

The template methodology was deemed useful for enabling systematic evaluation and identification of gaps in both the approach and management plans. Although the approach does not provide solutions, it can also facilitate work planning and prioritization to direct future efforts, with an emphasis on practical strategies and the development of alternate strategies if time horizons risk being too long. Finally, the process does not allow for the integration of socio-economic objectives and the direct identification of potential institutional (e.g., administrative, internal, or political) barriers to achieving some ecosystem objectives. Some of the fisheries plans already contain several management measures responsive to

socio-economic objectives but these were not evaluated through the current case study process.

4.2.2 Key issue identification

Each group was asked to name the top three ecosystem-based impacts or issues facing the Maritimes Region today. From their list, they were asked to select the most critical one and identify management measures and actions that could be implemented in the short, medium and long-term to address it. The results of this portion of the breakout group exercise were collated and reviewed by the Workshop Steering Committee at the end of day 2 to inform the Action Planning Exercise planned for day 3 of the workshop.

Based on the breakout group results, the Workshop Steering Committee identified and grouped critical issues into a total of four operational objectives and four implementation issues as outlined below, and listed associated potential action items to address these when provided.

Top Operational Objectives	*Top Implementation Issues*
1. Manage By-catch/Discards	1. Developing Indicators and Reference Points / Monitoring
2. Limit Benthic Impact	2. Balancing Ecosystem and Socio-Economic Objectives
3. Regulate Fishing Mortality	3. Stakeholder Buy-in
4. Manage Trophic Impacts	4. Ecosystem Boundaries and Scale

These eight critical issue categories formed the basis of the next exercise in plenary.

5.0 ACTION PLANNING EXERCISE

5.1 Methodology

The key operational objective and implementation issues identified in the case study breakout groups were posted on flip chart paper with their associated immediate/medium/long-term actions. For issues where no actions had been suggested the working group developed at least one action. Participants were asked to review the issues and actions and were given the opportunity to clarify or add new actions using the additional flip chart paper provided. After participants had reviewed the issues and actions they were given three colored sticky dots which corresponded to their branch, Science (green), FAM (red), OHB (blue) and Other (yellow). Other included, Area directors, CCG, Corporate Services, SCH, Policy and Economics, Communications and National Headquarters. Participants were asked to place their dots next to the issue or action item that they felt was a priority issue which required attention. The purpose of the different color dots was to identify if branches had different priorities. Following the exercise the results were quickly summarized and reported back to the group in plenary

5.2 Results

A summary of the results identified that, overall, managing by-catch and discards was identified as the number one priority for an operational objective, however, each of the other issues received adequate attention.

Ranked operational objective issues:

1.	Manage By-catch and Discards	34
2.	Limit Benthic Impacts	25
3.	Manage Trophic Impacts	16
4.	Regulate Fishing Mortality	14

It was clear from the summary of results that not all sectors had the same priority with regards to the operational objective issues, with each branch favoring a different issue. Fisheries and Aquaculture Management identified managing by-catch and discards as their priority. They also identified enhancing at-sea monitoring as an immediate priority action. Oceans and Habitat identified limit benthic impacts as their priority and also identified a priority action of assessing the significance of impacts of existing activities, including fisheries, aquaculture and land-based on benthic habitat. The other group identified regulating fishing mortality as their priority, with the priority action of auditing fishery monitoring programs (i.e., Dockside Monitoring Program)[3]. Science branch staff gave equal weight to managing by-catch and managing trophic impacts. Science did not identify any one priority action for managing by-catch or discards. With regards to managing trophic impacts it was identified that a better understanding of trophic structure/flow and capacity for recovery was needed over the long term.

For the implementation issues, one issue clearly stood out above the rest.

Ranked implementation issues:

1.	Balancing Ecosystem and Socio-economic Objectives	32
2.	Stakeholder Buy-in	21
3.	Develop Indicators and Reference Points/ Monitoring	14
4.	Ecosystem Boundaries and Scale	2

All Sectors identified balancing ecosystem and socio-economic objectives as their priority, with the exception of OHB which gave equal weighting to developing indicators and reference points/ monitoring. The priority action item for balancing ecosystem and socio-economic objectives was manager, science and stakeholder consultation to establish reference points. A complete breakdown of the results and action items can be found in Appendix 5.

As indicated each sector had a different priority for operational objectives. This is not surprising as work priorities of each Branch are different. However, it was interesting to note that all staff agreed that balancing ecosystem and socio-economic objectives was important and that this is something that the region should move forward with.

[3] NOTE: Audit procedures are already in place. The Canadian General Standards Board provides a dual audit function including procedural audits for initial DMP company designation, and periodic external follow-up audits to identify non-confirmities. As well DFO's Conservation and Protection Branch performs periodic field audits – of which approximately 300 have been completed in the previous two years. It is conceivable that the break-out group participants were either unaware of these audit functions, or felt the existing audit procedures are ineffective.

6.0 DISCUSSION AND RECOMMENDATIONS

During the plenary discussions, a number of observations and specific recommendations were made by participants as follows:

1. Continue to engage FAM on incorporating ecosystem objectives into Integrated Fisheries Management Plans and better addressing habitat policy issues such as no net loss and critical habitats.
2. Enhanced monitoring would be helpful, but we could get more data from existing monitoring programs if they were better integrated and more effectively and efficiently operated. This would be one way of obtaining more data on all species, particularly by-catch and discards, of both commercial and non-commercial, non-regulated species.
3. A workshop on by-catch and discards is needed.
4. Existing monitoring programs and levels must not be eroded due to lack of or redirected funding.
5. Overall IM message is complex, therefore needs reinforcement and simplification. We need to produce a guide to IM and glossary of terms for use by DFO staff and stakeholders.
6. All DFO Sectors should be encouraged to participate in activities such as RAPs.
7. We need to harmonize how we deal with clients (e.g. why is benthic monitoring required for aquaculture but not for scallop dragging?). Harmonization is essential if IM is to work.
8. Better coordination between individual initiatives is needed. We need to show how initiatives fit together and identify how they fit into the national planning process. A case in point is Ecologically and Biologically Significant Areas (EBSAs) and benthic habitat classification. Another is how the Precautionary Approach fits in.
9. IM should not be perceived as "anti-development". We should be seen as providing solutions for socio-economic development, while meeting ecosystem objectives. We must always consider socio-economic impacts of decisions. In support of this, we need to develop a framework for balancing ecosystem and socio-economic objectives. Industry should be involved in this process.
10. We need a common understanding and better product to show industry, and then we need to engage them in the process.
11. We need to have broader forums which include industry. "Intermediate level" forums were suggested as a means of focusing on broad-level objectives (e.g. have a workshop on benthic impacts of all activities, including fisheries, aquaculture, oil and gas, etc.).

7.0 CONCLUSION AND NEXT STEPS

The workshop was successful in providing education, understanding and ideas on how to implement ecosystem-based management in the Region, and the priority setting exercise proved very useful in providing direction for moving forward. In addition, all participants developed some level of understanding of the complexities involved in the implementation. Furthermore, it was important to engage Fisheries Management on phasing in the introduction of ecosystem-based management to all fisheries management plans, while at the same time being realistic about what we can achieve, especially in the short-term. The Workshop helped foster an improved culture of collaboration between and among Fisheries and Aquaculture Management, Science, and Oceans and Habitat Branches in support of integrated management planning.

One purpose of these Proceedings is to outline a series of recommendations and priority areas for action to facilitate implementation of ecosystem-based management in the

Maritimes Region. Accordingly, a key next step is to develop an Action Plan based on the workshop output for consideration by the Regional Management Committee (RMC) and the Departmental Management Committee (DMC). These results are not intended to reflect Departmental positions on topics covered, but rather, to inform and guide subsequent action planning exercises.

A number of recommendations stemming from the Workshop can be acted on immediately, such as the development of a guide to terms and approaches to ensure a common understanding of the language among all players. As well, there are future plans to conduct a workshop with the Scotia-Fundy Fishing Industry Roundtable representatives with similar objectives of increasing understanding of the ecosystem-based approach, developing awareness of deficiencies in current fisheries management plans and planning processes with respect to ecosystem objectives, and to develop a framework for balancing ecosystem and socio-economic objectives. In conjunction with other internal activities, this will ensure the Department is better able to respond to the current deliverables of the *Oceans Action Plan* and prepare for future Phase II deliverables.

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O'Boyle R., M. Sinclair, P. Keizer, K. Lee, D. Richard, and P. Yeats. 2005. Indicators for Ecosystem-Based Management on the Scotian Shelf: Bridging the Gap Between Theory and Practice. ICES Journal of Marine Science, 62: 598-605.

Appendix 1. List of Participants

The meeting was co-chaired by Chris Annand and Tim Hall. Opening remarks were by Faith Scattolon, and closing remarks by Neil Bellefontaine. The Senior Assistant Deputy Minister, Lucie McClung, was in attendance on the second day of the Workshop.

Last Name	*First Name*	*Afffiliation*
Allain	Bob	Fisheries & Aquaculture, RD, Gulf
Annand	Chris	Fisheries & Aquaculture, MH
Arbour	Joe	Oceans & Habitat, OCMD, BIO
Astephen	Stephanie	Oceans & Habitat, HMD, Sydney
Barratt	Cate	Communications Branch, MH
Bellefontaine	Neil	RDG, Maritimes, MH
Berthier	Jacinta	Fisheries & Aquaculture, Yarmouth
Boudreau	Paul	Oceans & Habitat, HMD, BIO
Branton	Bob	Science, BIO
Breeze	Heather	Oceans & Habitat, OCMD, BIO
Bugden	Gary	Science, BIO
Bundy	Alida	Science, BIO
Butler	Maureen	Fisheries & Aquaculture, MH
Buzeta	Maria-Ines	Science, SABS
Cherry	Mike	Fisheries & Aquaculture, MH
Claytor	Ross	Science, BIO
Coffen-Smout	Scott	Oceans & Habitat, OCMD, BIO
Crocker	Joe	Oceans & Habitat, HMD, BIO
Cusack	Mark	Fisheries & Aquaculture, BIO
Docherty	Verna	Fisheries & Aquaculture, MH
Duggan	Dave	Oceans & Habitat, OCMD, BIO
Farlinger	Sue	Director General, NHQ
Gavaris	Stratis	Science, SABS
Gentile	Paul	CGC, Sydney
Graham	Glen	CCG, Dartmouth
Green	Ryan	CCG, Saint John
Hall	Tim	Oceans & Habitat, OCMD, BIO
Hannah	Charles	Science, BIO
Hansen	Jorgen	Fisheries & Aquaculture, MH
Harrington	Anne	Fisheries & Aquaculture, SABS
Haya	Kats	Science, SABS
Herbert	Glen	Oceans & Habitat, OCMD, BIO
Hurlburt	Melanie	Oceans & Habitat, OCMD, BIO
Jamieson	Jim	Fisheries & Aquaculture, MH
Jones	Chris	Fisheries & Aquaculture, MH
Keating	Brian	Oceans & Habitat, HMD, Sussex
Keizer	Paul	Science, BIO
Kerr	Helen	Resource Management, NHQ
Lawton	Peter	Science, SABS
Lever	Margaret	Corporate Services, MH
MacLean	Allan	Fisheries & Aquaculture, MH
Marshall	Ian	Area Director, SWNS, Yarmouth
McClung	Lucie	Senior Associate Deputy Minister

Last Name	*First Name*	*Afffiliation*
McDonald	Melissa	Oceans & Habitat, OCMD, BIO
McMaster	Andrew	Fisheries & Aquaculture, MH
McMillan	Jim	Science, BIO
McPherson	Arran	Science, SARA office, BIO
Murphy	Odette	Fisheries & Aquaculture, MH
O'Leary	Shelley	Corporate Services, MH
Porter	Julie	Science, SABS
Potter	Ted	Oceans & Habitat, EAMP, BIO
Pottier-Jacquard	Elaine	Corporate Services, Yarmouth
Richard	Jackey	Small Craft Harbours
Rose	Carol Ann	Oceans & Habitat, RD, BIO
Scattolon	Faith	Assoc./RD-G, Maritimes, MH
Sephton	Tom	Science, BIO
Sinclair	Mike	Science, RD, BIO
Siron	Robert	Marine Ecosystems Cons. Br. NHQ
Stephenson	Rob	Science, SABS
Surette	Tim	Policy & Economics, RD, MH
Tracy	Roni-Sue	Fisheries Management, St. Andrews
van Helvoort	Gus	CGC, Sydney, Area Director
Walker	Bruce	Small Craft Harbours, St. Andrews
Weber	Gary	Fisheries & Aquaculture, MH
Wilson	Steve	Area Director, SWNB, SABS
Wilson	Trudy	Oceans & Habitat, RD's Off., BIO
Worcester	Tana	Science, BIO

Appendix 2. Terms of Reference

BACKGROUND

Since the Canada *Oceans Act* was proclaimed in 1997, DFO has developed a number of initiatives to achieve integrated management of its oceans. The Oceans Action Plan was released in June 2005 and gives operational impetus to the Oceans Act. Fishing activities are regulated by the Fisheries Act, a parallel set of legislation, and commands the attention of considerable resources within DFO. Fisheries Management Plans are in place for many stocks, the objectives of which have been discussed in the Objectives – Based Fisheries Management exercise. Now attention needs to be given to ensuring that these are consistent with the objectives of Integrated Management. This workshop is an opportunity for Maritimes Regional DFO staff to discuss implementation of IM, with primarily a fisheries management focus, to ensure that the intents of both the Oceans and Fisheries Act are achieved.

OBJECTIVES

The objectives of the workshop are:

- To ensure a consistent approach to Integrated Management within and amongst the Fisheries and Aquaculture Management, Oceans and Habitat, and Science sectors
- To ensure that the objectives of Objectives Based Fisheries Management are consistent with those of Integrated Management
- To provide DFO regional staff with a common understanding of current integrated management issues and initiatives
- To recommend and prioritize activities of a work plan to achieve Phase I deliverables of the Oceans Action Plan and to prepare the region for Phase II

DESCRIPTION

The workshop will be a combination of short presentations of integrated management initiatives in the region, breakout groups to discuss the details of integrated management and plenary discussion to achieve consensus where possible on solutions to issues and future actions.

PRODUCTS

A proceedings documenting the discussion and outlining recommendations for actions to facilitate implementation of the Oceans Action Plan in Maritimes Regions will be produced.

A document describing integrated management will also be produced based on the discussion of the workshop which would be available as a guide to DFO staff and stakeholders.

PARTICIPATION

The workshop will be a cross section of Maritimes DFO staff from FAM, Oceans and Science. About 40 – 50 staff, who have been engaged in integrated management issues will be invited.

Appendix 3. Agenda

Day 1: Wednesday, October 12th – Setting the Stage

12:00 – 13:00	Registration
13:00 – 13:15	Welcome and Purpose of Workshop (C. Annand)
13:15 – 13:30	Introduction and Comments (F. Scattolon)
13:30 – 13:55	Overview of Oceans Management Planning Process (T. Hall)
13:55 – 14:15	Overview of Fisheries and Aquaculture Management Planning Process (C. Annand)
14:15 – 14:35	Review and Discussion
14:35 – 15:00	**Scotian Shelf Integrated Management** - Eastern Scotian Shelf Integrated Management (ESSIM) Initiative (S. Coffen-Smout) - Bras d'Or Collaborative Environmental Planning Initiative (CEPI) (D. Duggan)
15:00 – 15:15	Health Break
15:15 – 15:45	**Gulf of Maine Integrated Management** - International Collaboration in the Gulf of Maine (T. Hall) - Gulf of Maine Ecosystem-based Management Initiative (S. Gavaris)
15:45 – 16:30	Other Related Initiatives (T. Worcester)
16:30 – 17:00	Review and Discussion

Day 2: Thursday, October 13th – Case Study: Operationalizing IM

08:30 – 09:00	Guidance to Breakout Groups – Assigned Participation (O. Murphy)
09:00 – 10:00	Breakout Group Discussion
10:00 – 10:15	Health Break
10:15 – 12:00	Breakout Group Discussion Continued
12:00 – 13:00	Lunch
13:00 – 15:00	Breakout Group Discussion Continued
15:00 – 15:15	Health Break
15:15 – 17:00	Plenary Discussion
17:30 – 19:00	Reception with Senior Associate Deputy Minister, Lucie McClung

Day 3: Friday, October 14th – Workplan Priorities

08:30 – 09:00	Review of Case Study Highlights
09:00 – 10:00	Action Planning Exercise
10:00 – 10:15	Health Break
10:15 – 12:00	Plenary Discussion and Way Forward (N. Bellefontaine)
12:00	Adjourn.

Appendix 4 (A). Case Study Templates

1. Generic template
2. Georges Bank template
3. St. Marys Bay template
4. Eastern Scotian Shelf template

1. Generic Template

Ocean Impacts												
National DFO Framework for Ecosystem Objectives			**Biodiversity Conservation Objectives**			**Productivity Conservation Objectives**			**Habitat Conservation Objectives**			
			Community Diversity	**Species Diversity**	**Population Diversity**	**Primary Productivity**	**Trophic Structure (Food web relationships)**	**Population productivity**	**Landscapes/ Bottomscapes**	**Water Column Properties**	**Water/Sediment quality**	**Biota Quality**
IM Area Conceptual Objective			1 Maintain important and sensitive benthic communities 2. Maintain important and sensitive pelagic communities 3. Maintain community assemblages	1. Maintain or recover commercially harvested fish and invertebrate species 2. Ensure recovery of species at risk 3. Limit incidental mortality of non-target species 4 Minimize spread of invasive species	Maintain genetic diversity within populations (Prevent elimination of spawning/ breeding component by human activity)	Maintain primary production	1 Maintain adequate forage species for higher predators 2. Maintain trophic structure of communities	1 Maintain productivity of commercial species 2 Maintain productivity of non-commercial species	1. Maintain a diversity of habitats	Prevent significant alteration to natural sediment and water column conditions	1 Prevent toxic chemical contamination 2. Minimize garbage in the marine environment 3. Minimize harmful levels of noise	Minimize harmful contaminant levels in marine biota
IM Area Operational Objective (or Sub-Objective) Action verb, indicator and reference point			1. Limit % ***area disturbed*** of each community type (benthic, pelagic, community assemblages)	1. Limit incidental ***bycatch or mortality*** (species at risk, non target species) 2. Control/Monitor ***change in invasive species distribution***	1. Distribute ***component catch as a % of component biomass*** 2. Distribute ***mortality on each population component***	1. Limit alteration of ***essential nutrient concentrations*** affecting primary production 2. Monitor phytoplankton/ zooplankton abundance composition, CPR Colour Index	1. Limit ***mortality on forage fish*** 2. Limit ***biomass removal per trophic level*** or ***trophic level catch biomass*** with respect to trophic demands of next higher level 3. Limit ***total catch biomass*** within system production capacity	1. Keep ***fishing mortality*** moderate 2. Permit sufficient ***spawning biomass*** to evade exploitation. 3. Promote positive ***biomass change*** when biomass is low. 4. Manage % size/age/sex of capture 5. Limit fully recruited fishing mortality 6. Prevent activity in spawning area/seasons 7. Limit mortality on spawners during spawning season 8. Manage discarded catch	1. Limit % ***area disturbed*** of habitat types.	1. Limit ***amounts of contaminants, toxins and waste*** introduced in habitat 2. Limit ***area where concentration of each contaminant in water column above acceptable level*** 3. Limit ***area where concentration of oxygen in water column above acceptable level***	Limit ***bottom area in which composition is adversly altered (surficial sediment, geochemical)*** 2. Minimize ***amount of lost gear*** 3. Control ***noise levels/ frequencies*** with respect to distribution of species at risk	Limit ***biota with contaminants above the acceptable levels***
Ocean Industry	**Planning Tools**	**Impacting Activity**										
Fishery	Individual fishery management plans	Gear- related impacts: Removal of biota	Gear damage to benthic communities Removal of biota	Removal of biota: target Removal of biota, bycatch: SAR, nontarget	Removal of biota: genetically distinct populations, spawning components		Removal of biota: forage species, disturbance of trophic balance	Removal of biota: Target Removal of biota: Bycatch	Gear impacts on habitat		Vessel pollution Garbage and Gear Loss: Ghost Fishing Vessel noise	
New Fisheries	Protocol on New Fisheries	Gear- related impacts: Removal of biota	Gear damage to benthic communities Removal of biota	Removal of biota: target Removal of biota, bycatch: SAR, nontarget	Removal of biota: genetically distinct populations, spawning components		Removal of biota: forage species, disturbance of trophic balance	Removal of biota: Target Removal of biota: Bycatch	Gear impacts on habitat		Vessel pollution Garbage and Gear Loss: Ghost Fishing Vessel noise	

1. Generic Template Cont'd

Ocean Impacts												
National DFO Framework for Ecosystem Objectives			Biodiversity Conservation Objectives			Productivity Conservation Objectives			Habitat Conservation Objectives			
			Community Diversity	Species Diversity	Population Diversity	Primary Productivity	Trophic Structure (Food web relationships)	Population productivity	Landscapes/ Bottomscapes	Water Column Properties	Water/Sediment quality	Biota Quality
Shipping	DOT Planning/ Small Craft Harbours/ Coast Guard	Ballast Discharge		Ballast water								
		Vessel traffic		Ship Collisions							Vessel Pollution Vessel noise	
		Oil discharge								Introduction of oil		Introduction of oil
Telecommunications		Submarine cables	Presence of structures		Disturbance of spawning area				Disturbance of bottom habitat			
Aquaculture	Site selection	Finfish Cage Operations	Presence of Structures	Escapement of non native species	Escapement of non native species	Nutrient loading			Disturbance of bottom habitat	Eutrophication of bottom sediments- reduced oxygen	Food, antibiotic waste	Pollutants
		Mussel Culture Operations	Presence of structures									
Tourism	Cruiseships/ Whale Watching	Tourism Outlook		Ship Collisions							Vessel pollution Vessel noise	
Science Research	Trawl Survey Plans + (Foreign Research Surveys)	Trawl	Gear damage to benthic communities Removal of biota	Removal of biota: target Removal of biota, bycatch: SAR, nontarget	Removal of biota: genetically distinct populations, spawning components		Removal of biota: forage species, disturbance of trophic balance	Removal of biota: Target Removal of biota: Bycatch	Gear impacts on habitat		Vessel pollution Garbage and Gear Loss: Ghost Fishing Vessel noise	
Ocean Disposal	CEPA regulatory process	Dredge Waste	Smothering of benthos								Dredge waste contaminant loading	Pollutants
Sewage Disposal/ Land run off		Sewage Waste									Sewage waste contaminant loading	Pollutants

Sources:

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Gavaris, S, Porter, JM, Stephenson, RL, Robert, G and DS Pezzack (2005) Review of Management Plan Conservation Strategies for Canadian Fisheries on Georges Bank: A test of a practical ecosystem-based framework.

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Scotian Shelf ICES CM 2005/BB:18

O'Boyle, R, Sinclair, M, Keizer, P, Lee, K, Ricard, D and P Yeats (2004) Operationalizing an Ecosystem Conservation Framework for the Eastern Scotian Shelf CSAS Res Doc 2004/076

OCMD (2005) Developing ecosystem objectives for the ESSIM Initiative

2. Case Study Template: Georges Bank

Ocean Impacts												
National DFO Framework for Ecosystem Objectives			**Biodiversity Conservation Objectives**			**Productivity Conservation Objectives**			**Habitat Conservation Objectives**			
			Community Diversity	**Species Diversity**	**Population Diversity**	**Primary Productivity**	**Trophic Structure**	**Population productivity**	**Landscapes/ Bottomscapes**	**Water Column and Sediment Properties**	**Biota Quality**	
IM Area Operational Objective (or Sub-Objective) Action verb, indicator and reference point or direction			Limit ***% area disturbed*** of each benthic community type	1. Limit ***the number, duration and extent of interactions*** with species at risk (see link). 2. Prevent ***introduction*** and inhibit ***spread*** of invasive species (see link). 3. Minimize impacts on non-target species.	1. Distribute ***mortality on each population component in proportion to population biomass***. 2. Conserve ***genetic and phenotypic variation within and among populations.***	Limit ***alteration of essential nutrient concentrations*** affecting primary production.	1. Limit ***mortality on forage fish***. 2. Distribute ***biomass removal across trophic levels***. 3. Limit ***total biomass removals*** within system production capacity.	1. Keep ***intentional mortality of target species*** within previously defined limits. 2. Limit ***incidental mortality of target species***. 3. Limit ***mortality of reproductive animals***, particularly within spawning aggregations. 4. Limit disruption of reproductive activity. 5. Promote positive biomass change when biomass is low. 6. Distribute mortality over size/age/sex structure.	1. Prevent ***net loss of Fish Habitat*** as defined in the Fisheries Act. 2. Prevent the ***damage or destruction*** of critical habitat or residences of species at risk as defined in the Species-At-Risk Act. 3. Limit ***total area disturbed*** of biogenic habitat-forming structures.	1. Keep ***intentional input of contaminants, waste and noise*** into the marine environment within previously defined limits. 2. Restore ***water column and sediment properties*** when they exceed previously defined limits. 3. Minimize quantity of non-functional gear/equipment within the marine environment (e.g. gear loss, old pipelines).	Minimize ***disturbance of animals*** within the marine environment.	
Ocean Industry	**Planning Tool**	**Impacting Activity**										
Fishery- Scallop	Scotia Fundy Offshore Scallop IFMP	Scallop Dredge										
Lobster	Offshore Lobster IFMP/Lobster Advisory Body	Traps										
Jonah Crab	Licence Conditions	Traps										
Herring	Scotia Fundy Herring IFMP	Purse Seine/ Mid water trawl										
Groundfish	Groundfish IFMP	Longline										
		Trawl										
		Gillnet										
Shipping	DOT Planning/ Small Craft Harbours	Ballast Discharge										
		Vessel traffic										
Telecommunications	Telecommunications	Submarine cables										
Science Research	Trawl Survey Plans (Foreign) Research Surveys	Trawl or other gear										

3. Case Study Template: St. Mary's Bay

Ocean Impacts												
National DFO Framework for Ecosystem Objectives			**Biodiversity Conservation Objectives**			**Productivity Conservation Objectives**			**Habitat Conservation Objectives**		
			Community Diversity	**Species Diversity**	**Population Diversity**	**Primary Productivity**	**Trophic Structure**	**Population productivity**	**Landscapes/ Bottomscapes**	**Water Column and Sediment Properties**	**Biota Quality**
EM Area Operational Objective (or Sub-Objective) Action verb, **indicator and reference point or direction**			Limit % ***area disturbed*** of each benthic community type	1. Limit ***the number, duration and extent of interactions*** with species at risk (see list). 2. Prevent ***introduction*** and inhibit ***spread*** of invasive species (see list).	1. Distribute ***mortality on each population component in proportion to population biomass***. 2. Conserve ***genetic and phenotypic variation within and among populations.***	Limit ***alteration of essential nutrient concentrations*** affecting primary production.	1. Limit ***mortality on forage fish.*** 2. Distribute ***biomass removal across trophic levels.*** 3. Limit ***total biomass removals*** within system production capacity.	1. Keep ***intentional mortality of target species*** within previously defined limits. 2. Limit ***incidental mortality of target species***. 3. Limit ***mortality of reproductive animals***, particularly within spawning aggregations. 4. Limit disruption of reproductive activity. 5. Promote positive biomass change when biomass is low. 6. Distribute mortality over size/age/sex structure.	1. Prevent ***net loss of Fish Habitat*** as defined in the Fisheries Act. 2. Prevent the ***damage or destruction*** of critical habitat or residences of species at risk as defined in the Species-At-Risk Act. 3. Limit ***total area disturbed*** of biogenic, habitat-forming structures.	1. Keep ***intentional input of contaminants, waste and noise*** into the marine environment within previously defined limits. 2. Restore ***water column and sediment properties*** when they exceed previously defined limits. 3. Minimize quantity of non-functional gear/ equipment within the marine environment (e.g. lost fear, old pipelines)	Minimize ***disturbance of animals*** within the marine environment.
Ocean Industry	**Planning Tool**	**Impacting Activity**									
Fisheries -Lobster	LFA34 Advisory Committee	Traps									
Clams: Quahogs	SWNS Soft Shell clam Adv. Comm. St. Mary's Bay Licence Holder Groups	Non-Vessel based (hand held tools)									
		Vessel based (hydraulic dredging)									
Groundfish & Scolpin*	Groundfish IFMP Fleet CHPs	Fixed Gear Gillnet, Longline, Otter Trawl*									
Scallop	Inshore Scallop Adv. Comm. (ISAC)	Scallop dredge									
Herring	Herring IFMP, Scotia Fundy Herring Adv. Comm.	Weirs									
Elvers/eels	SF Elvers IFMP, SF elvers Adv. Comm.	Pots, traps, fyke nets, weirs, dip nets									
Gaspereau	MPFRs and licence conditions	Gillnet									
Sea Urchin	Digby Kings/ Annapolis Co. Licence Holder Group	Sea Urchin Divers									
Rock/Jonah Crab	Licence Holder Group (IFMP to follow)	Traps									
Sea Cucumber	Protocol on New Fisheries	Dredging									

3. Case Study Template: St. Mary's Bay Cont'd

Ocean Impacts											
National DFO Framework for Ecosystem Objectives			Biodiversity Conservation Objectives			Productivity Conservation Objectives			Habitat Conservation Objectives		
			Community Diversity	Species Diversity	Population Diversity	Primary Productivity	Trophic Structure	Population productivity	Landscapes/ Bottomscapes	Water Column and Sediment Properties	Biota Quality
Marine Worms	Marine Worm CHP Protocol on New Fisheries	Non-Vessel Based (hand held tools)									
Recreational Fisheries	MPERs and licence conditions (where applicable)	Diving and Hook & line fishing									
Shipping	DOT Planning - Small Craft Harbours	Ballast Discharge									
		Vessel Traffic									
Aquaculture	Site selection process, CEAA, NWPA (new sites)	Salmon leases, land based cod, halibut hatchery, quahog lease									
Ecotourism		Vessel noise, proximity, traffic									
Sewage Disposal: Land run off		Sewage waste									
* directed sculpin fishery in St. Mary's Bay											

4. Case Study Template: Eastern Scotian Shelf

Ocean Impacts												
National DFO Framework for Ecosystem Objectives			**Biodiversity Conservation Objectives**			**Productivity Conservation Objectives**			**Habitat Conservation Objectives**		
			Community Diversity	**Species Diversity**	**Population Diversity**	**Primary Productivity**	**Trophic Structure**	**Population productivity**	**Landscapes/ Bottomscapes**	**Water Column and Sediment Properties**	**Biota Quality**
IM Area Operational Objective (or Sub-Objective) Action verb, indicator and reference point or direction			Limit % ***area disturbed*** of each benthic community type	1. Limit ***the number, duration and extent of interactions*** with species at risk (see list). 2. Prevent ***introduction*** and inhibit ***spread*** of invasive species (see list).	1. Distribute ***mortality on each population component in proportion to population biomass***. 2. Conserve ***genetic and phenotypic variation within and among populations.***	Limit ***alteration of essential nutrient concentrations*** affecting primary production	1. Limit ***mortality on forage fish.*** 2. Distribute ***biomass removal across trophic levels.*** 3. Limit ***total biomass removals*** within system production capacity.	1. Keep ***intentional mortality of target species*** within previously defined limits. 2. Limit ***incidental mortality of target species***. 3. Limit ***mortality of reproductive animals***, particularly within spawning aggregations. 4. Limit disruption of reproductive activity. 5. Promote positive biomass change when biomass is low. 6. Distribute mortality over size/age/sex structure.	1. Prevent ***net loss of Fish Habitat*** as defined in the Fisheries Act. 2. Prevent the ***damage or destruction*** of critical habitat or residences of species at risk as defined in the Species-At-Risk Act. 3. Limit ***total area disturbed*** of biogenic, habitat-forming structures.	1. Keep ***intentional input of contaminants, waste and noise*** into the marine environment within previously defined limits. 2. Restore ***water column and sediment properties*** when they exceed previously defined limits. 3. Minimize quantity of non-functional gear/ equipment within the marine environment (e.g. lost gear, old pipelines).	Minimize ***disturbance of animals*** within the marine environment.
Ocean Industry	**Planning Tool**	**Impacting Activity**									
Fisheries	Offshore Lobster IFMP & Offshore Lobster Management Board	Traps									
	Offshore Scallop IFMP & Offshore Scallop Advisory Committee	Scallop Dredge									
	Shrimp Integrated Mobile Gear Fisheries Management Plan & Shrimp Advisory Committee	Shrimp trawl									
	Snow Crab IFMP CFA 20-22 & ENS Snow Crab Advisory Committee	Traps									
	Swordfish + Tuna IFMP (2003-2005) & Atlantic Large Pelagics Advisory Committee	Longline									
	Shark IFMP 20022007 (ALPAC & SELPAC)	Longline									
	Herring OBFM Plan (2003-2008) & Herring Advisory Committee	Purse Seine/ Mid water trawl									

4. Case Study Template Eastern Scotian Shelf Cont'd

Ocean Impacts												
National DFO Framework for Ecosystem Objectives			Biodiversity Conservation Objectives			Productivity Conservation Objectives			Habitat Conservation Objectives		
			Community Diversity	Species Diversity	Population Diversity	Primary Productivity	Trophic Structure	Population productivity	Landscapes/ Bottomscapes	Water Column and Sediment Properties	Biota Quality
Fisheries (...cont.)	Groundfish Management Plan (2002-2007) (OBEM Pilot) & Groundfish Advisory Committee	Longline									
		Trawl									
		Gillnet									
	Offshore Surf Clam & Quahog IFMP & Offshore Clam Advisory Committee	Hydraulic Dredge									
New Fisheries	New Fisheries Policy (RDSAB and 3 Area DSABs); Hagfish CHP	Hagfish barrels									
	New Fisheries Policy (RDSAB and 3 Area DSABs)	Sea Cucumber dredge									
	New Fisheries Policy (RDSAB and 3 Area DSABs)	Stone Crab traps									
Oil and Gas	CNSOPB Planning (SEAs, activity authorizations, guidelines, regs)	Drilling waste inputs (muds, solids, produced water)									
		Seismic operations									
		Other acoustic disturbance (production platforms & pipelines)									
Shipping	Transport Can, IMO Planning	Ballast Discharge									
	Coast Guard	Vessel traffic									
		Oil discharges									
Telecommunications		Submarine cables									
Tourism	Cruiseship Industry	Ballast Discharge									
		Vessel traffic									
Scientific Research	Trawl Survey Plans + (Foreign Research Surveys)	Trawl									
Ocean Disposal	CEPA regulatory process	Dredge Waste									

Appendix 4(B). Case Study Worksheet

As a group, read through each IM Area Operational Objective listed in the Table provided for your geographic area (St. Marys Bay, Sable/Banquereau, or Georges Bank). Note that these are meant as *examples* of operational objectives for discussion purposes only; please do not get hung up on the wording used or the most appropriate linkage to National Objectives.

Based on the expertise and interests of your group, select an initial IM Area Operational Objective to investigate in detail. Highlight the column associated with this objective (use the highlighter provided), then answer each question in Section A for this column. If time permits, select additional IM Area Operational Objectives to work through.

Section A

Answer questions A1-3 for each cell in the highlighted column (sample response on following page). Use the computer or flip-chart paper to record your responses. Answer questions A4 and A5 in the space provided.

A1. Briefly describe whether and/or how each Impacting Activity affects the IM Area Operational Objective you have selected. Provide examples.

A2. Where relevant, briefly describe how the Planning Tools associated with each Impacting Activity address this Operational Objective. List any relevant management measures or actions (e.g. gear specifications, time area closures).

A3. List any performance indicators and reference points that may have been identified within relevant Planning Tools to monitor/measure how well this Operational Objective is being addressed? If known, please indicate whether these indicators are monitored effectively.

A4. Are there any other Planning Tools (e.g. coral conservation plan) that are currently being used to address this Operational Objective in your geographic area?

A5. Overall, how well does the full array of Planning Tools and associated management measures address this Operational Objective for your geographic area?

Section A: Sample Response to Questions A1-3

IM Area Operational Objective			*Limit interaction with species at risk.*
Fisheries	Offshore Lobster IFMP & Management Board	Traps	A1) Cusk caught as by-catch in lobster traps. A2) No measures yet in place. A3) None.

Section B

Next, select an initial Impacting Activity that the group would like to investigate in detail. Highlight the row associated with this activity, and answer questions B1-3 for each cell. Use the computer or flip-chart paper to record your responses. Answer questions B4 and B5 in the space provided. If time permits, select additional Impacting Activities to work through.

B1. Briefly describe how this Impacting Activity affects each of the relevant IM Area Operational Objectives. Provide examples.

B2. Briefly describe whether and/or how the Planning Tools associated with this Impacting Activity address each relevant Operational Objective. List any specific management measures or actions (e.g. gear specifications, time area closures).

B3. List any performance indicators and reference points identified within the Planning Tools to monitor/measure how well each Operational Objective is being addressed? If known, please indicate whether these indicators are monitored effectively.

B4. Are there management measures currently being implemented for this activity that do not have any obvious links to a National Ecosystem Objective? Provide examples.

B5. Overall, how well does the full array of Planning Tools and associated management measures address the impacts that this activity may be having on National Ecosystem Objectives and potential IM Area Operational Objectives?

Section C

C1. Does this approach, i.e. identifying how each proposed operational objective is being impacted and addressed by each activity-specific planning tool, seem like a useful exercise to help us identify strengths and weaknesses in our ability to achieve National and Regional Ecosystem Objectives? Explain.

C2. List the top three ecosystem-based impacts/issues facing the Maritimes Region today (e.g. by-catch, biodiversity conservation, benthic disturbance). Be specific. Issues do not have to be limited to those described in the tables provided.

C3. From this list, select one issue that you feel is the most critical for Maritimes DFO and identify management measures or actions that could be implemented in the short, medium and long-term to address it. Issues and actions identified here will be used to inform the Action Planning exercise tomorrow.

Appendix 5. Action Planning Exercise Results

Open Space Exercise Results- Operational Objectives*

	Science (Green)	Oceans (Blue)	FAM (Red)	Other (Yellow)	Total
1. Manage By-catch/ Discards	**10**	**6**	**13**	**5**	**34**
- Short term actions:					
Enhance at sea monitoring	3	1	8	2	**14**
Estimate by-catch in all fisheries where possible	3	2	2	1	**8**
Identify knowledge gaps					
- Medium term actions:					
Incorporation into IFMPs and assessments		1	1		**2**
Work with industry to increase accuracy		1	2	2	**5**
- Long term actions:					
Gear modifications					
Estimate all human induced mortality on all species and determine impact	3	1			**4**
Research Vessel Survey- identify and quantify the non groundfish and non commercial invertebrates	1				**1**
2. Limit Benthic Impacts	**8**	**11**	**5**	**1**	**25**
- Short term actions:					
New Fisheries: Opt for least impacting gear					
Classify Benthic Habitat					
- Medium term actions:					
Assess significance of impacts of existing activities including, fisheries, aquaculture and land based on benthic habitat	6	10	5		**21**
Zoning	2			1	**3**
Develop cost effective monitoring tools					
- Long term actions:					
Reduce impacts where reference points are exceeded					
Integrate Benthic Classification with EBSAs					

Open Space Exercise Results- Operational Objectives*

	Science (Green)	Oceans (Blue)	FAM (Red)	Other (Yellow)	Total
Share Benthic Classification tool with Fisheries Management					
Aquaculture- PBS and field effects		1			**1**
3. Regulate Fishing Mortality	**3**	**1**	**2**	**8**	**14**
- Short term actions:					
Incorporate unaccounted human induced mortality in assessments			2	3	**5**
- Medium term actions:					
Audit fishery monitoring programs (i.e. DMP)	3	1		5	**9**
Work with industry to foster compliance and greater understanding of longer term impacts of fishing mortality					
- Long term actions:					
Collaborative approach with industry					
4.Manage Trophic Impacts	**10**	**2**	**3**	**1**	**16**
- Short term actions:					
Limit New Fisheries on forage fish	1			1	**2**
Extend range of DFO surveys, record all species captured					
- Medium term actions:					
Analysis/modelling of impact of fishing activities on trophic structure	2				**2**
Modelling/ Monitoring programs for effects associated with Aquaculture					
- Long term actions:					
Better understanding of trophic structure/ flows and capacity for recovery	7	2	3		**12**
Make plans flexible enough to deal with environmental factors such as climate change					

Open Space Exercise Results- Implementation Issues*

	Science (Green)	Oceans (Blue)	FAM (Red)	Other (Yellow)	Total
1. Develop Indicators and Reference Points/ Monitoring	**3**	**9**	**2**		**14**
- Short term actions:					
Identify operational objectives which are key issues *(using risk assessment approach and prioritize. Integrate data from a wide range of operational systems)*	2	8	2		**12**
Enhance monitoring capabilities					
- Medium term actions:					
Develop case studies and trials of various operational indicators					
Objectives need to be based on impacts not independent program priorities to allow integration into other federal mandates					
Aquaculture- PBS	1	1			**2**
2. Balancing Ecosystem and Socio-Economic Objectives	**6**	**9**	**12**	**5**	**32**
			5		**5**
- Short term actions:					
Managers/ Science/ Stakeholder consultations to establish Reference Points	3	6	6	4	**19**
Identify hotspots for conflicting uses and focus on those		1			**1**
Determine what we are managing for					
Increase stakeholder understanding of benefits					
- Medium term actions:					
Build multi species economic models to explore socio-economic and ecosystem consequences of different management strategies	1		1		**2**
High level Department discussion and decision on Federal government objectives, priorities and implementation	2	2			**4**

Open Space Exercise Results- Implementation Issues*

	Science (Green)	Oceans (Blue)	FAM (Red)	Other (Yellow)	Total
Define socio-economic outcomes for Aquaculture				1	1
3. Stakeholder Buy-in	**5**	**3**	**9**	**4**	**21**
		1	1	1	
- Short term actions:					
Improve clarity of Operational Objectives		1	1		
Glossary of terms					
Workshop with industry roundtable					
Support capacity building within industry			4	2	
More inclusive RAP and Advisory Committees- Oceans, Science, Habitat	4	1	2		
- Medium term actions:					
Enhance industry understanding of impacts of fishing on ecosystem by developing simulation models	1		1		
Aquaculture- Bay of Fundy Forum				1	
4.Ecosystem boundaries and Scale		**2**			**2**
Nested system of management areas exist Principle: resolve issues at most relevant local scale		2			
Operational objectives apply to all scales, but priorities and reference points are area specific					

* Items in italics are the additional entries made on the flip charts by individual participants during the plenary open space exercise.